NON-PUBLIC?: N
ACCESSION #: 9305170262
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Joseph M. Farley Nuclear Plant - Unit 1 PAGE: 1 OF 3

DOCKET NUMBER: 05000348

TITLE: Reactor Trip Following Actuation Of Protective Relays On
The 1B Unit Auxiliary Transformer
EVENT DATE: 06/29/91 LER #: 91-007-01 REPORT DATE: 05/11/93

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R. D. Hill, General Manager - Nuclear TELEPHONE: (205) 899-5156
Plant

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: EA COMPONENT: XFMR MANUFACTURER: W120
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 2045 on 6-29-91, a Unit one reactor trip occurred. Two of the neutral overcurrent relays on the 1B unit auxiliary transformer (UAT) actuated resulting in a generator trip. By design, the generator trip caused the turbine to trip and the turbine trip caused the reactor to trip.

The low and high setpoint neutral overcurrent relays on the 1B UAT actuated as a result of an electrical fault. The fault was caused by a broken strand of a multiple stranded conductor coming into contact with the grounded core frame structure of the transformer. The multiple stranded conductor is located in the transformer oil box and connects the transformer winding to the transformer output bushing.

The conductor was repaired by removing the loose strand and reinsulating the conductor. The integrity of the conductor and crimp connection was

verified prior to reinstallation of the insulation.

The 1B UAT was returned to service on 3-16-93 at 0227.

END OF ABSTRACT

Plant and System Identification

Westinghouse - Pressurized Water Reactor
Energy Industry Identification System codes are identified in the text as XX!.

Summary of Event

At 2045 on 6-29-91, a reactor trip occurred. Two of the neutral overcurrent relays on the 1B UAT EA! actuated resulting in a generator trip. By design, the generator trip caused the turbine to trip and the turbine trip caused the reactor to trip.

Description of Event

On 6-29-91, Unit 1 was operating at approximately 100 percent power. At 2045, the low and high setpoint neutral overcurrent relays on one of the low side windings (Y winding) of the 1B UAT actuated. By design, this protective relay scheme caused the main generator to trip. The main turbine and reactor tripped per design in response to the generator trip.

Following the trip the operators implemented FNP-1-EEP-0 (Reactor Trip or Safety Injection) and FNP-1-ESP-0.1 (Reactor Trip Response), ensuring that the unit was safely in Mode 3 (Hot Standby). The unit was maintained in a stable condition.

After the trip occurred, an investigation was conducted to determine the cause. Testing performed on the transformer and its associated 4160 volt cables and protective relaying was indeterminate. The transformer was then energized and partially loaded and instrumented with test equipment during the Unit 1 eleventh refueling outage (September - December, 1992) with no problems indicated.

Upon Unit 1 startup on December 2, 1992, while at approximately 13 percent reactor power, a turbine trip and exciter breaker trip occurred shortly after generator field voltage was applied. Generator output voltage had reached approximately 10 kv or 45 percent rated terminal voltage when the trip occurred. Initial investigation revealed that a

ground fault had occurred on the 1B UAT Y winding circuit. The test equipment which had been set up after the initial trip indicated that a fault had occurred inside the transformer. When the transformer oil box was partially disassembled and inspected, the broken conductor strand was located.

Cause of Event

The fault was the result of a broken strand of a multiple stranded conductor internal to the transformer coming into contact with the grounded core frame structure of the transformer. A contributing factor was the proximity of the loose strand to the transformer oil pump discharge. Another factor was the unraveled insulation on the conductor which allowed the oil pump discharge to force the strand from the crimp towards the grounded core frame support structure.

Reportability Analysis and Safety Assessment

This event (on 6-29-91) is reportable because of the actuation of the reactor protection system. After the trip, the following safety systems operated as designed:

- main feedwater was isolated with flow control valves and bypass valves closed,
- auxiliary feedwater pumps started automatically and provided flow to the steam generators,
- source range nuclear instrumentation automatically energized,
- pressurizer heaters and spray valves operated automatically as required to maintain system pressure.

There was no effect on the health and safety of the public.

Corrective Action

The conductor was repaired by removing the loose strand and reinsulating the conductor. The integrity of the conductor and crimp connection was verified prior to reinstallation of the insulation.

The 1B UAT was returned to service on 3-16-93 at 0227.

Inspection of the other UATs will be performed during the next refueling outage on each unit. The next refueling outage on Unit 1 is scheduled to begin in March of 1994 and the next refueling outage on Unit 2 is scheduled to begin in September, 1993. A study was conducted to

determine if the design of the Farley Nuclear Plant start-up transformers (SUTs) could present similar problems. The study indicated that the UATs and the SUTs are similar in design, thus the start-up transformers will also be scheduled for inspection during the next refueling outages on each unit.

Additional Information

No similar LER's have been submitted by Farley Nuclear Plant.

This event would not have been more severe if it had occurred under different operating conditions.

The unit returned to power operation at 0642 on 7-1-91 after the 6-29-91 event.

ATTACHMENT 1 TO 9305170262 PAGE 1 OF 1

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Southern Nuclear Operating Company

the southern electric system

J. D. Woodard
Vice President
Farley Project

10 CFR 50.73

May 11, 1993

Docket No. 50-348

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Joseph M. Farley Nuclear Plant - Unit 1
Licensee Event Report No. LER 91-007-01

Gentlemen:

Joseph M. Farley Nuclear Plant Unit 1 Licensee Event Report Number LER 91-007-01 is being submitted in accordance with 10 CFR 50.73. If you have any questions, please advise.

Respectfully submitted,

J. D. Woodard

EFB:cht-licevent.nrc

Enclosure

cc: Mr. S. D. Ebneter
Mr. G. F. Maxwell

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